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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,826	01/23/2002	John Wasserbauer	47321/PAN/C715	7783

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BARLOW, JOSEPHS & HOLMES, LTD.
101 DYER STREET
5TH FLOOR
PROVIDENCE, RI 02903

EXAMINER
FLORES RUIZ, DELMA R

ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/054,826	WASSERBAUER, JOHN	
	Examiner	Art Unit	
	Delma R. Flores Ruiz	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

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TECHNOLOGY CENTER 2800

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Jewell et al (5,719,894).

Regarding claim 1, Jewell disclose a surface emitting laser, comprising; an active region (see Fig. 9a – 10b Character 110), comprising a plurality of quantum wells (see Fig. 9b and 10b Character 16, and 128), formed between first mirror (see Fig. 9aCharacter 102) and second mirror (see Fig. 9a Character 116), and wherein gain of each of said quantum wells or groups of quantum wells operate quasi-independently at different temperatures such that stimulated emission is dominated by a different quantum well of group of quantum wells at different temperature (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 2, Jewell disclose a thickness of said quantum wells varies from well or between groups of wells so that transition energy and thereof gain peak wavelength varies from well to well or between groups of wells (Abstract, Column 16, Lines 16 –34, Column 17, Lines 19 – 29, and Column 19, Lines 26 - 46)

Regarding claim 3, Jewell disclose a material composition of said wells varies from well or between groups of wells to provide varying conduction and valence offset between the quantum wells and associated barriers layer (Column 16, Lines 56 – 64).

Regarding claim 4, Jewell disclose an active region (see Fig. 9b and 10b, Character 110) further comprises a barrier layer (see Fig. 9b and 10b, Character 54' and 70') sandwiched between each of said quantum wells, wherein thickness of said barrier layer varies to barrier or between group of barrier so that transition energy and therefore gain peak wavelength varies from well to well or between groups of wells (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 5, Jewell disclose an active region (see Fig. 9b and 10b, Character 110) further comprises a barrier layer (see Fig. 9b and 10b, Character 54' and 70') sandwiched between each of said quantum wells, wherein material composition of said barrier layer varies to barrier or between group of barrier so that

transition energy and therefore gain peak wavelength varies from well to well or between groups of wells (Figs. 1 – 11, Abstract, Column 6, Lines 38 – 58, Column 16, Lines 16 –34, Column 17, Lines 19 – 29, and Column 19, Lines 26 - 46, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 6 Jewell disclose a material composition of said quantum wells varies from well to well or between groups of well to induce varying levels of stain from quantum well to quantum well or between groups of quantum wells to provide varying conduction and valence band offset between the quantum wells and associated barrier layers, Column 16, Lines 16 –34, Column 17, Lines 19 – 29, and Column 19, Lines 26 - 46, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 7 and 8, Jewell disclose a quantum wells are gain matched such that the fraction of carries contributing to stimulated emission is substantially constant over temperature and wherein thickness of said quantum wells decreases from well to well or between group of wells, such that each well to group of well operate at roughly the same internal efficiency η_i at different temperature (See Figs. 1 – 11, and Column 16, Lines 56 – 64).

Regarding claim 9 Jewell, discloses an active region (see Fig. 9a – 10b Character 110) further comprises a barrier layer (see Fig. 9b and 10b Character 54' and 70') sandwiched between each of said quantum wells, wherein material composition of said barrier layer varies from barrier layer to barrier layer or between groups of barrier layers, so that the barrier layer with greatest band offset provides majority of gain at a high operating temperature and the barrier layer with lowest ban offset provides majority of gain a low operating temperature (Figs. 1 – 11, Column 6, Lines 38 – 58, Column 16, Lines 56 – 64, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 10 Jewell discloses a material composition of said quantum well varies from well to well or between groups of wells to provide varying conduction and valence band offset between the quantum wells and associated barrier layers such that each well or group of wells operate at roughly the same η_i and η at different temperature (See Figs. 1 – 11, and Column 16, Lines 56 – 64).

Regarding claim 11, Jewell disclose material composition of said quantum well varies from well to well or between groups of wells to induce varying levels of strain from quantum well to quantum well or between groups of quantum wells such that quantum wells with the highest strain provides majority of gain at a high operating temperature and quantum well with lowest strain provides majority of gain at a low

operating temperature (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 12, Jewell disclose a first group of wells comprising a first number to wells provides majority of gain at a high operating temperature and a second group of wells comprising a second number of wells provides majority of gain at a low operating temperature and wherein the first number of wells id grater that the second number of wells (see Figs. 1 – 11).

Regarding claim 13, Jewell disclose optical confinement factor varies from well to well or between group wells levels such that the quantum well having largest optical confinement factor provides majority of gain at high operating temperature and the quantum well having the smallest optical confinement factor provides majority of gain a low operating temperature (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 14, Jewell disclose a laser further comprises and anode for injecting holes into said active region and wherein the quantum well that supplies majority of gain at a high operating temperature is closet to said anode and wherein the quantum well that supplies majority of gain at a low operating temperature is further

from said anode (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 15, Jewell disclose a level of non-radioactive recombination centers varies from well to well or between groups of wells, and wherein the quantum well with least number of non-radioactive recombination centers provides majority of gain at a high operating temperature and the quantum well with the most non-radioactive recombination centers provides majority of gain at a low operating temperature (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 16, Jewell disclose a method for forming a temperature insensitive surface-emitting laser, comprising the steps of; forming an active region (see Fig. 9a – 10b, Character 110) comprises a plurality of gain separate quantum wells that operate quasi-independently over temperature and wherein said quantum wells are gained matched such that fraction of carrier that contribute to stimulated emission is substantially constant over temperature and forming a second mirror (see Fig. 9a Character 116) on said active region (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claims 17 and 19, Jewell disclose the step of forming a plurality of gain separate quantum wells comprises forming a plurality of quantum wells (see Fig. 9b and 10b, Characters 126, and 128) having varying thickness (Figs. 1 – 11, Column 6, Lines 38 – 58, Column 17, Lines 19 – 29, Column 19, Lines 26 – 46, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 18, Jewell disclose a plurality of quantum wells having varying thickness comprises varying thickness of said quantum well so that each well of group of wells dominates operation of the surface emitting laser over a predetermined temperature range (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Regarding claim 20, Jewell disclose the step of forming a plurality of quantum wells having varying gain enhancement factor comprises varying the gain enhancement factor of said quantum wells so that η is substantially constant over temperature (Figs. 1 – 11, Column 6,Lines 38 – 58, Column 35, Lines 35 – 68, and Column 36, Lines 39 – 68).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (703) 308-6238. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.

Delma R. Flores Ruiz
Examiner
Art Unit 2828

Paul Ip
Supervisor Patent Examiner
Art Unit 2828

DRFR/PI
April 27, 2003